SPECIFICATIONS FOR LiDAR SERVICES

This document is a reference guide for consultants providing LiDAR services for Central Federal Lands Highway Division (CFLHD) of the Federal Highway Administration (FHWA), Lakewood, Colorado.

I. GENERAL DESCRIPTION

The work consists of LiDAR data collection in FHWA U.S. Customary Units format, also known as the U.S. Survey Foot (one meter equals 3937/1200 feet.). The Technical Requirements section of this specification document indicates more specific requirements.

II. TECHNICAL REQUIREMENTS

A. All MicroStation® files shall be in V8 most current edition.

B. FHWA shall furnish ground control points within the project area, some of which, FHWA may withhold from the Contractor for the purpose of verifying the accuracy of the LiDAR coverage.

C. The Contractor shall make the necessary adjustments to insure that the LiDAR TIN file shall fit the control provided at a 95% confidence level to an accuracy of 0.3 foot vertically and 0.50 foot horizontally throughout the project area.

D. The LiDAR data shall be separated into three ASCII files:

1. The Post-Processed Raw LiDAR Data file containing the un-thinned point cloud.

2. The unthinned Bald Earth LiDAR Data file containing all the data points that depict the ground surface with the all points which represent vegetation, structures or other non-surface features removed.

3. A thinned Bald Earth LiDAR Data file containing those data points needed to accurately depict the ground surface with all points that represent vegetation, structures and other features deleted. Care should be taken to ensure that steep terrain areas are not accidentally filtered out with the vegetation. Major thinning of data should only be performed where there is little elevation change, to ensure accurate data around grade changes. This file should be thinned so as to produce a Digital Terrain Model (DTM) with an average cell size (shot spacing) of approximately 10 feet in a TIN triangle format.

E. Both the Post-Processed Raw LiDAR Data and the Bald Earth LiDAR Data files shall be recorded as space-delimited ASCII (text) files with each data point's coordinates given in the order Easting, Northing and Elevation (XYZ) for each project area.

F. Create thinned Microstation V8 DTM files from the thinned ASCII Bald Earth data file, which incorporates break line enforced Bald Earth LiDAR Data. Breaklines along the edge of road and on the centerline are needed. These breaklines shall be placed with vertices at least every 5 feet to ensure an accurate depiction of the road surface. The LiDAR points in the roadway between the edge of road break lines shall be removed. Each DTM file shall be of a size acceptable to the COTR and each DTM shall fit against adjacent DTMs without gaps.

    1. The contractor shall create a triangular irregular network (TIN) file compatible with GeoPak® current edition, if possible. The TIN shall be derived from the MicroStation® DTM file(s) described above.

G. All digital files shall be placed on DVD+R disks in ¼" jewel cases with disk labels and jewel case inserts stating the Contractor's name, date and names and sizes of the files contained.